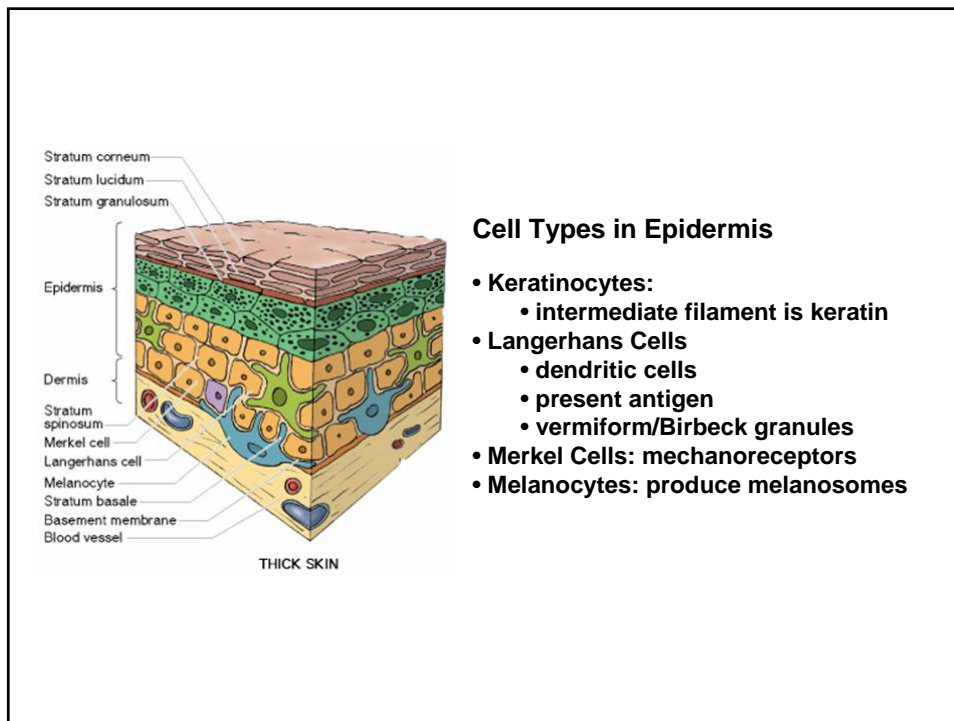
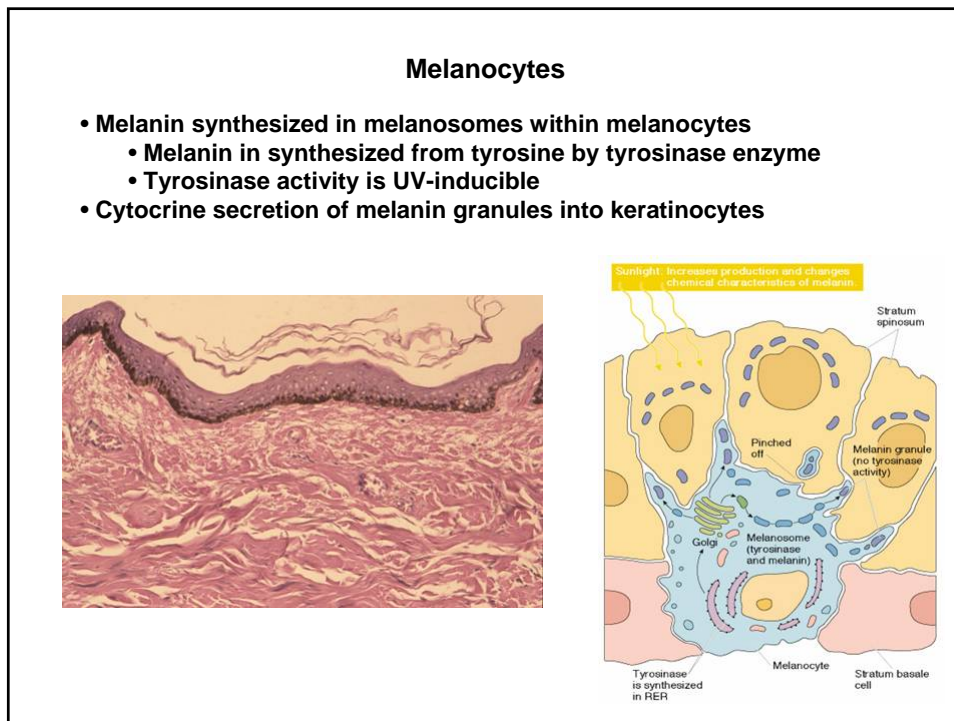
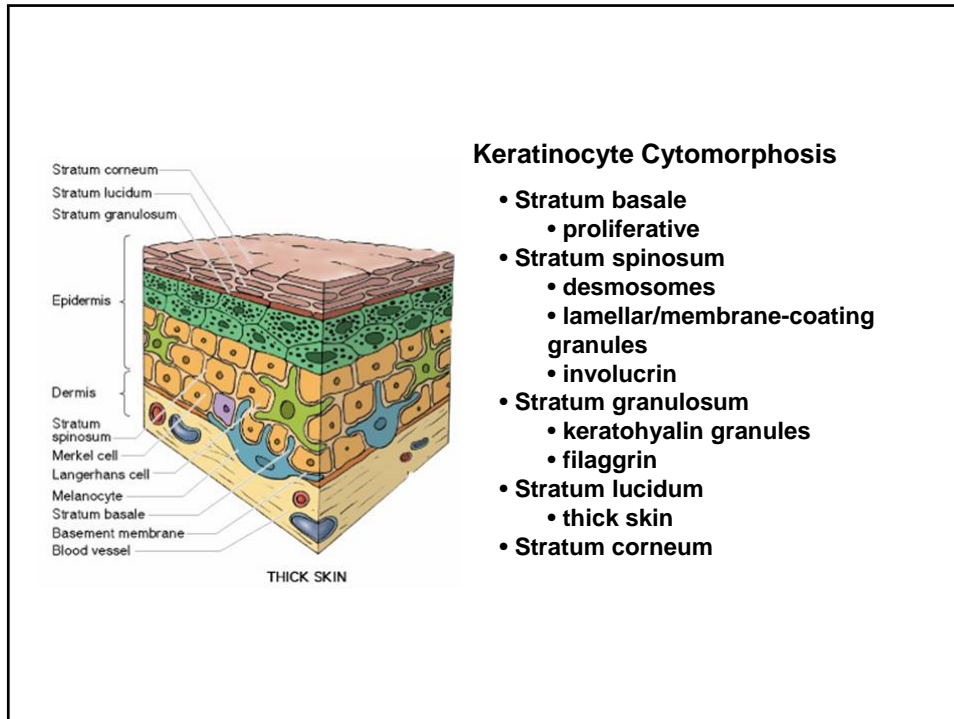


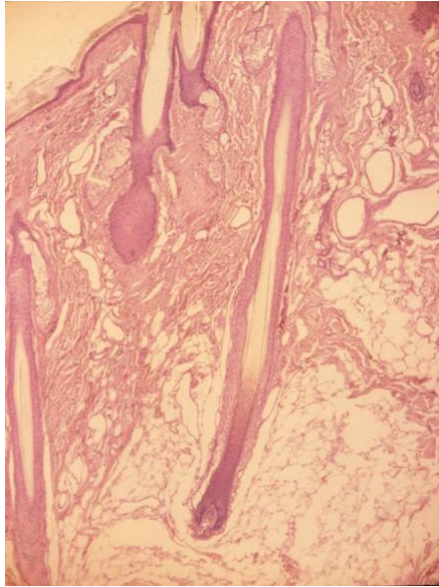
- **Epidermis**
 - Stratified, squamous keratinized epithelium
 - Appendages
 - hair follicles
 - nails
 - sweat glands
 - sebaceous glands
 - mammary glands
- **Dermis**
 - Dense, irregular connective tissue
- **Hypodermis**
 - Superficial fascia



Cell Types in Epidermis

- **Keratinocytes:**
 - intermediate filament is keratin
- **Langerhans Cells**
 - dendritic cells
 - present antigen
 - vermiform/Birbeck granules
- **Merkel Cells:** mechanoreceptors
- **Melanocytes:** produce melanosomes

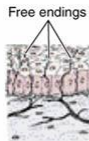




- **Papillary dermis: numerous cells**
 - **Fibroblasts**
 - loose collagen
 - type III: reticular fibers
 - type VII: anchoring fibrils
 - fine elastic fibers
 - **Capillaries and arteriovenous anastomoses**
 - **Immune system cells**
 - **Mechanoreceptors**
 - Free nerve endings
 - Meissner's corpuscles
 - Krause's corpuscles
- **Reticular dermis: fewer cells**
 - **Fibroblasts**
 - type I collagen
 - thick elastic fibers
 - **Sweat glands**
 - **Hair follicles**
 - **Arrector pili muscles**
 - **Sebaceous gland**
 - **Mechanoreceptors**
 - Pacinian corpuscles
 - Ruffini corpuscles

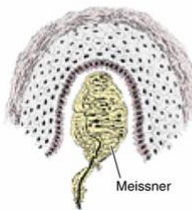
Sensory Mechanoreceptors in the Integument

Free nerve endings
Epidermis and dermis



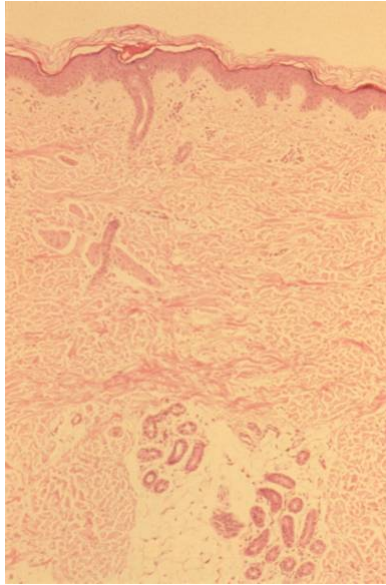
Pacinian
Reticular dermis
Pressure
Vibration
Course touch
Tension

Meissner
Dermal papillae
Light touch



Krause
Cold?
Mechanical stimuli

Ruffini (not shown)
Tensile force



Eccrine Sweat Gland

- Simple coiled tubular gland
- Sympathetic, cholinergic innervation
- Duct
 - Stratified cuboidal
 - Opens on surface of epidermis
 - Resorbs potassium, sodium and chloride ions
 - Excretes urea and lactic acid
- Secretory unit
 - Mixed cuboidal, columnar, and pseudostratified
 - Merocrine mechanism
 - Dark cells
 - Clear cells
 - Contractile myoepithelial cells

Apocrine Sweat Gland



- Simple or branched coiled tubular gland
- Sympathetic, adrenergic innervation
- Duct
 - Stratified cuboidal
 - Opens into hair follicle
- Secretory unit
 - Large lumen stores secretion
 - Cuboidal or columnar
 - Merocrine mechanism
 - Odorless viscous secretion
 - Hormonally responsive, begin to function at puberty
 - Contractile myoepithelial cells
- Restricted distribution: axilla, anus, areola, auditory canal, eyelids

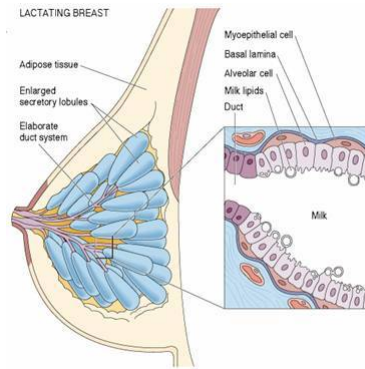
Sebaceous Gland

- Branched tubuloalveolar gland
- Duct
 - Stratified squamous
 - Usually open into hair follicles
- Secretory unit
 - Acini contain small basal cells and large round cells that fill the lumen
 - Holocrine mechanism
 - Oily sebum secretion
 - Hormonally responsive

Mammary Gland

- Compound tubuloalveolar gland
 - 15-20 lobes separated by connective tissue (collagen and adipose)
 - each lobe is drained by a lactiferous duct leading to the nipple
 - lactiferous sinus near distal end of duct
 - near nipple, duct is stratified squamous
 - throughout duct and sinus: stratified cuboidal
 - small ductules leading to lactiferous duct: simple columnar
- Identical in male/female until puberty
 - estrogen and progesterone (ovary)
 - prolactin (anterior pituitary)
- Inactive gland
 - similar to lactating, but alveoli are not developed

Lactating Mammary Gland



- **During pregnancy**
 - Elevated progesterone and estrogen (ovary and placenta)
 - Ducts grow and branch
 - Alveoli develop and mature
 - cuboidal cells
 - myoepithelial cells
 - Colostrum accumulates
 - will be ejected day 1-3
 - contains lymphocytes, monocytes, antibodies, lactalbumin, minerals, electrolytes
- **Prolactin surge (anterior pituitary)**
 - Stimulates milk production
 - day 4-continuous
 - Contains proteins, lipids, antibodies, lactose, vitamins, minerals, electrolytes
- **Oxytocin (posterior pituitary)**
 - Stimulates milk ejection or "let down"